

CLAIMS

What is claimed is:

sub A3> 1. A drive pin for the fastening of a material to a metal base member with an automatic nailer, said drive pin comprising:

a substantially cylindrical shank;

a head coupled to said shank;

a knurl rolled upon said shank, said knurl having a plurality of substantially parallel spiral grooves, wherein each of said spiral grooves subtends an angle of at least 15 degrees relative to an axis of said shank; and

a ballistic tip coupled to said shank and configured to penetrate said material and said metal base member under force of said automatic nailer.

sub B2> 2. A drive pin as claimed in claim 1 wherein said spiral-groove angle is no greater than 30 degrees relative to said shank axis.

3. A drive pin as claimed in claim 2 wherein said spiral groove angle is substantially 26 ± 2 degrees relative to said shank axis.

4. A drive pin as claimed in claim 1 wherein:
adjacent ones of said spiral grooves are separated by
spiral ridges;
each of said spiral grooves and ridges has a substantially
equal length; and
each of said spiral ridges is substantially unbroken
throughout said length.

Sub A-1> 5. A drive pin as claimed in claim 4 wherein:
said shank has a base diameter in a range of 0.0625 to
0.125 inch;
said spiral grooves have a minor diameter less than said
base diameter; and
said spiral ridges have a major diameter greater than said
base diameter.

Sub B-1> 6. A drive pin as claimed in claim 5 wherein:
said base diameter is 0.098 ± 0.003 inch;
said minor diameter is 0.084 ± 0.003 inch; and
said major diameter is 0.112 ± 0.003 inch.

7. A drive pin as claimed in claim 5 wherein:
said base diameter is 0.110 ± 0.003 inch;
said minor diameter is 0.096 ± 0.003 inch; and
said major diameter is 0.124 ± 0.003 inch.

8. A drive pin as claimed in claim 5 wherein:
said spiral grooves and ridges together form a plurality of
threads; and
each of said threads is ^{rolled} full upon said shank.

11/2 Sub 9. 9. A drive pin as claimed in claim 1 wherein:
said metal base member is a first sheet metal;
said material is a second sheet metal; and
said knurl is rolled tight to said head.

10. A drive pin as claimed in claim 1 wherein:
said material is gypsum sheathing; and
said head is a cupped bugle head.

Sub 11. 11. A drive pin as claimed in claim 1 wherein:
said knurl has at least seven of said spiral grooves; and
each of said spiral grooves has an independent start.

12. A drive pin as claimed in claim 11 wherein said knurl
has no more than fourteen of said spiral grooves.

Sub A₆ 13. A construction assembly effected by an automatic nailer, said construction assembly comprising:

- a sheet-metal substrate;
- a material attached to said sheet-metal substrate; and
- a drive pin attaching said material to said sheet-metal substrate, said drive pin comprising:
 - a substantially cylindrical shank;
 - a head coupled to said shank;
 - a knurl formed of a plurality of threads rolled full upon said shank to produce a plurality of substantially parallel spiral grooves, wherein each of said spiral grooves subtends an angle of no less than 15 and no greater than 30 degrees relative to an axis of said shank; and
 - a ballistic tip coupled to said shank and configured to penetrate said material and said sheet-metal substrate under force of said automatic nailer.

Sub A₇ 14. A construction assembly as claimed in claim 13 wherein said spiral-groove angle is substantially 26 ± 2 degrees relative to said shank axis.

Sub A₈ 15. A construction assembly as claimed in claim 13 wherein said sheet-metal substrate is a sheet-steel framing member having a thickness of 0.0179 to 0.0966 inch.

Sub B₁ 16. A construction assembly as claimed in claim 15 wherein said sheet-steel framing member has a thickness of no more than 0.0428 inch.

said material is a sheet metal; and
said knurl is rolled tight under said head.

said material is gypsum sheathing; and
said head is a cupped bugle head.

said knurl has at least seven and no more than fourteen of
said spiral grooves;

each of said spiral grooves and ridges has a substantially equal length; and

each of said spiral ridges is substantially unbroken throughout said length.

20. A drive pin for the fastening of a material to a sheet-metal framing member with an automatic nailer, said drive pin comprising:

a substantially cylindrical shank having a base diameter in a range of 0.0625 to 0.125 inch;

a head coupled to a first end of said shank;

a knurl formed of at least seven and no more than fourteen substantially parallel spiral grooves having a minor diameter less than said base diameter, wherein adjacent ones of said spiral grooves are separated by substantially unbroken spiral ridges having a major diameter greater than said base diameter, and wherein said spiral grooves and ridges together form a plurality of threads rolled full upon a portion of said shank at an angle of substantially 26 ± 2 degrees relative to an axis of said shank;

a ballistic tip coupled to a second end of said shank and configured to penetrate said material and said framing member under force of said automatic nailer.

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